

Remarks

The Applicants confirm the election of Group I including Claims 1-5, 10 and 12. The Applicants have accordingly cancelled Claims 6-9, 11 and 13. However, the Applicants specifically reserve the right to file one or more divisional applications directed to the subject matter of those claims.

The Applicants acknowledge the objection to Claim 5 with respect to multiple dependencies. Claim 5 has accordingly been amended to depend solely from Claim 2. However, new Claims 14 and 15 have been added. They are the same as Claim 5 except they depend from Claims 3 and 4, respectively.

The Applicants acknowledge the double-patenting rejection with respect to Claims 1-5, 10 and 12. The Applicants accordingly submit an appropriate Terminal Disclaimer. Withdrawal of the provisional double-patenting rejection is respectfully requested.

Applicants have amended Claim 1 to recite that the hot-rolled steel sheet has a ferrite phase with an average grain size of $10\mu\text{m}$ or less. Support may be found at page 28, lines 20-22, and elsewhere.

The Applicants acknowledge the rejection of Claim 1 as being obvious over Maid. In view of the above-described amendment to Claim 1, the Applicants respectfully submit that that rejection is moot. In any event, Maid does not disclose, teach or suggest certain claimed composing elements of the invention as recited in Claim 1:

- (1) Al content is limited to less than 0.02%;
- (2) N/Al is limited to 0.3 or more.

The features mentioned above are indispensable composing elements of Claim 1 and have important technical effects. When the Al content is less than 0.02%, N in the dissolved state increases and variations in strain aging hardenability, caused in proportion to the changes in manufacturing conditions, diminishes. With N/Al of 0.3 or more, a

necessary amount of dissolved N is able to be contained.

It is important to secure N in the dissolved state by means of suppressing the precipitation of AlN to achieve strain aging hardenability. Reduction of Al content has the effects of retarding the starting time of the precipitation of AlN, while slowing down the precipitation rate of AlN. This is an indispensable element for stably achieving a high level of strain aging hardenability. Al is limited to less than 0.02% to achieve the foregoing matters in an industrial base. Also, even if the Al content is limited, dissolved N becomes low when the N content relative to Al content is too small. To avoid this, limitation of N/Al to at least a fixed quantity is an indispensable element. To put this into practice in an industrial base, N/Al is necessary to be 0.3 or more. In the examples (in Table 1) of Maid, the N content is 0.006%, Al content is 0.025% and N/Al is 0.24 and these values do not achieve a BH of 80 MPa or more which is an object of Claim 1. Further, the description of Maid in Column 4, lines 24 – 29 does not achieve an increase of TS which is an object of Claim 1.

The Applicants acknowledge the rejection of Claims 2-5 as being obvious over the hypothetical combination of Tosaka with Maid. The Applicants respectfully submit that one of ordinary skill in the art would not make the hypothetical combination as set forth in the Official Action and, in any event, that the resulting hypothetical combination would be non-enabling. Detailed reasons are set forth below.

As noted in the title of Maid, it discloses a hot-rolled strip having a dual phase structure. The hot-rolled steel strip is produced from a steel having particular C, Si, Cr, P, S, Al, N and Mn quantities. That steel is hot-rolled and then rapidly cooled immediately after finish rolling down to a coiling temperature at a rate of 30-70°C/sec. The cooled strip is then coiled at a temperature in the range of 350-190°C. At that point, the hot-rolled strip is complete.

This is in sharp contrast to Tosaka which is directed to a cold-rolled sheet. Those

of ordinary skill in the art are well aware that the processes and characteristics associated with hot-rolled sheets and cold-rolled sheets are very, very different. In any event, Tosaka teaches taking a steel slab having particular quantities of C, Si, Mn, Nb and Al, hot rolling the slab, hot-roll finishing the slab and then coiling at a temperature of 650-500°C.

Then, the hot-rolled sheet is cold rolled and annealed to form a fine recrystallized structure. The annealing temperature is in the range of 720-780°C. If the annealing temperature is lower than 720°C, the recrystallization does not satisfactorily progress and the elongation and stretch flanging properties are lowered, thereby making it impossible to obtain satisfactory properties. On the other hand, if annealing temperatures are higher than 780°C, a softening disadvantage occurs to the grain growth.

By virtue of the utilization of the cold-rolling process described by Tosaka, it is possible to obtain a fine recrystallized structure having a mean grain diameter of 20 μ m or less.

If one of ordinary skill in the art were to utilize the teachings of Tosaka to have the fine recrystallized ferrite structure having a mean grain diameter of 20 μ m or less, it would be necessary for a person of ordinary skill in the art to utilize the cold rolling and subsequent annealing process taught by Tosaka. The problem with that is that the resulting steel would then be a cold-rolled steel, not a hot-rolled steel as explicitly claimed in Claims 2-5. Thus, even if one of ordinary skill in the art makes the hypothetical combination, the resulting product is still not what is claimed herein.

There is a further problem with Tosaka. Tosaka fails to provide teachings to those of ordinary skill in the art as to how to achieve a mean grain diameter of 20 μ m or less without using the cold-rolling and continuous annealing process described by Tosaka. Thus, Tosaka is non-enabling with respect to teaching how to achieve a mean grain diameter of 20 μ m or less in a hot-rolled steel sheet. Tosaka only teaches how to obtain

the fine recrystallized ferrite structure in a cold-rolled sheet, which is not what the Applicants claim.

By way of summary, even if one of ordinary skill in the art combines the cold-rolling methodology of Tosaka with Maid, the result is a cold-rolled steel sheet which is not what the Applicants claim. On the other hand, Tosaka fails to provide teachings or suggestions to those of ordinary skill in the art as to how to achieve a mean grain diameter of $20\mu\text{m}$ or less without cold rolling. Tosaka in that context is non-enabling.

The Applicants respectfully request withdrawal of the 35 U.S.C. §103 rejection of Claims 2-5.

In light of the foregoing, the Applicants respectfully submit that the entire application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,



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